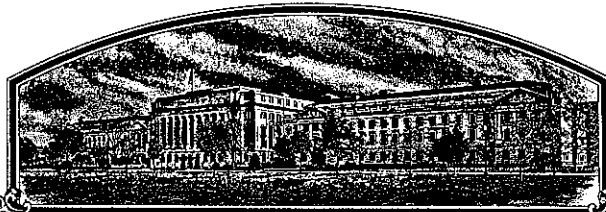


No.

8800146



# THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

## Hyperformer Seed Company

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED NOVEL VARIETY OF SEXUALLY REPRODUCED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF *eighteen* YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, OR IMPORTING IT, OR EXPORTING IT, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT (ACT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

SOYBEAN

'HSC Baldwin'

In Testimony Whereof, I have hereunto set my hand and caused the seal of the Plant Variety Protection Office to be affixed at the City of Washington, D. C. this 30th day of November in the year of our Lord one thousand nine hundred and eighty-eight.

Attest

*Kenneth H. Kerns*  
Commissioner  
Plant Variety Protection Office  
Agricultural Marketing Service

*Richard E. Lyng*  
Secretary of Agriculture

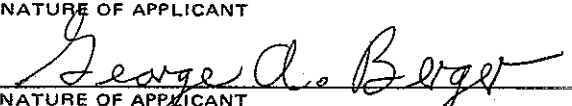


U.S. DEPARTMENT OF AGRICULTURE  
AGRICULTURAL MARKETING SERVICE

FORM APPROVED: OMB NO. 0581-0055

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE  
(Instructions on reverse)

1. NAME OF APPLICANT(S) HYPERFORMER SEED COMPANY		2. TEMPORARY DESIGNATION HB-15578-E4-6		3. VARIETY NAME HSC Baldwin	
4. ADDRESS (Street and No. or R.F.D. No., City, State, and Zip Code) Suite 3200, Clark Tower 5100 Poplar Avenue Memphis, Tennessee 38137		5. PHONE (Include area code) 800-238-7174 901-761-0050		FOR OFFICIAL USE ONLY VPVO NUMBER 8800146	
6. GENUS AND SPECIES NAME Glycine max		7. FAMILY NAME (Botanical) Leguminosae		FILING DATE May 9, 1988 TIME 1:30 <input type="checkbox"/> A.M. <input checked="" type="checkbox"/> P.M.	
8. KIND NAME Soybeans		9. DATE OF DETERMINATION June 1987		AMOUNT FOR FILING \$ 1800.00 DATE May 31 1988	
10. IF THE APPLICANT NAMED IS NOT A "PERSON," GIVE FORM OF ORGANIZATION (Corporation, partnership, association, etc.) Corporation				FEES RECEIVED AMOUNT FOR CERTIFICATE \$ 200.00 DATE Oct. 24, 1988	
11. IF INCORPORATED, GIVE STATE OF INCORPORATION Delaware				12. DATE OF INCORPORATION 1977	
13. NAME AND ADDRESS OF APPLICANT REPRESENTATIVE(S), IF ANY, TO SERVE IN THIS APPLICATION AND RECEIVE ALL PAPERS Dr. George A. Berger Eagle Seed Company P.O. Box 308 Weiner, Arkansas 72479 PHONE (Include area code): 501-684-7377					
14. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED					
a. <input checked="" type="checkbox"/> Exhibit A, Origin and Breeding History of the Variety (See Section 52 of the Plant Variety Protection Act.)					
b. <input checked="" type="checkbox"/> Exhibit B, Novelty Statement.					
c. <input checked="" type="checkbox"/> Exhibit C, Objective Description of Variety (Request form from Plant Variety Protection Office.)					
d. <input checked="" type="checkbox"/> Exhibit D, Additional Description of Variety.					
e. <input checked="" type="checkbox"/> Exhibit E, Statement of the Basis of Applicant's Ownership.					
15. DOES THE APPLICANT(S) SPECIFY THAT SEED OF THIS VARIETY BE SOLD BY VARIETY NAME ONLY AS A CLASS OF CERTIFIED SEED? (See Section 83(a) of the Plant Variety Protection Act.) <input type="checkbox"/> Yes (If "Yes," answer items 16 and 17 below) <input checked="" type="checkbox"/> No					
16. DOES THE APPLICANT(S) SPECIFY THAT THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			17. IF "YES" TO ITEM 16, WHICH CLASSES OF PRODUCTION BEYOND BREEDER SEED? <input type="checkbox"/> Foundation <input type="checkbox"/> Registered <input type="checkbox"/> Certified		
18. DID THE APPLICANT(S) PREVIOUSLY FILE FOR PROTECTION OF THE VARIETY IN THE U.S.? <input type="checkbox"/> Yes (If "Yes," give date) <input checked="" type="checkbox"/> No					
19. HAS THE VARIETY BEEN RELEASED, OFFERED FOR SALE, OR MARKETED IN THE U.S. OR OTHER COUNTRIES? Limited test market in the U.S. in June 1987. <input checked="" type="checkbox"/> Yes (If "Yes," give names of countries and dates) <input type="checkbox"/> No					
20. The applicant(s) declare(s) that a viable sample of basic seeds of this variety will be furnished with the application and will be replenished upon request in accordance with such regulations as may be applicable. The undersigned applicant(s) is (are) the owner(s) of this sexually reproduced novel plant variety, and believe(s) that the variety is distinct, uniform, and stable as required in Section 41, and is entitled to protection under the provisions of Section 42 of the Plant Variety Protection Act. Applicant(s) is (are) informed that false representation herein can jeopardize protection and result in penalties.					
SIGNATURE OF APPLICANT 				DATE April 15, 1988	
SIGNATURE OF APPLICANT				DATE	

## EXHIBIT A

## ORIGIN AND BREEDING HISTORY OF THE VARIETY BALDWIN

HSC Baldwin was a single  $F_4$  plant selection from the cross OP 76-622 X Bedford. OP 76-622 was a  $F_4$  single plant selection from the cross of Forrest X Essex.

1. This plant was selected at Weiner, Arkansas, in 1981. Seed yields was in the top 10% of all plants selected including check varieties. Preliminary yield trials were conducted in 1982 and 1983 at Weiner, Arkansas. This line exceeded the yields of each of the two check varieties Forrest and Centennial in both years of the trials. A small increase was started in 1984.
2. Advanced trials were conducted in 1985, 1986 and 1987. Yield was sufficient to increase this line in 1986 and 1987.

## YIELD SUMMARY

NAME OF VARIETY	1985 ARKANSAS	1985 GEORGIA	1986 ARKANSAS	1986 GEORGIA	1986 S.CAROLINA	1987 ARKANSAS	1987 MISS.
HSC BALDWIN	42	38	37	41	27	33	25
CENTENNIAL	36	38	38	42	25	30	25

1985 Arkansas and 1985 Georgia data taken at one location in each state.  
1986 and 1987 Arkansas and 1987 Mississippi data are averages over 11 locations respectively.

1986 Georgia data is 6 location average.

1986 South Carolina data is 3 location average.

3. HSC Baldwin has been rouged for offtypes in the vegetative state. Seed will have an occasional (.02%) buff hila types. Seed coat will occasionally show a greenish color, especially under late planting.

4. Other variances which are also acceptable and predictable are white flower color 1/5000 and grey pubescence 1/7000. These characters are stable and can be maintained and reproduced through seed without changing as has been exhibited in three generations of increase.

## EXHIBIT B

## NOVELTY STATEMENT

HSC Baldwin appears most similar to the Centennial variety. It is novel in the following characteristics.

1. Soybean cyst nematode reaction to SCN races 2,3,5, and to an unknown race which reacted differently on the differentials than any presently defined race and is designated as "race undefined" (RU) and is given in the following table and indicates that HSC Baldwin and Centennial react differently to different SCN races.

## REACTION OF SOYBEAN CULTIVARS TO FOUR RACES OF SOYBEAN CYST NEMATODES

.....1986 2/.....

NAME OF VARIETY	R2	R3	R5	RU <u>1/</u>
HSC Baldwin	62	11	33	17
Centennial	104	.2	55	18

1/ This race has been described and proposed to be designated as race 6. Official designation and publication of the description has not been made.

2/ This table shows the reproduction index which is calculated by dividing the average number of cysts counted on the variety by the average number of cysts counted on a susceptible check cultivar, usually Lee.

Cyst Nematode screening performed by Dr. R.W. Riggs, Department of Plant Pathology, College of Agriculture, University of Arkansas, Fayetteville, Arkansas.

2. HSC Baldwin has shiny seed coat luster and Centennial has dull seed coat luster.
3. HSC Baldwin averages approximately 4 days earlier than Centennial over many test locations.
4. The foliage of HSC Baldwin is darker green than the yellow green of Centennial.

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## EXHIBIT B

## NOVELTY STATEMENT

The ISCC-NBS ( Inter-Society Color Council-National Bureau of Standards) Centroid Color Chart, No. 2106, was used to determine leaf (foliage) color of fully expanded leaves from HSC Baldwin and Centennial soybeans.

Paired comparison data from foliage samples of three replications for each variety at two growth stages was taken. Since the same color determinations were found in each replication, data for replications is not shown. However, data for the two growth stages, ( R1, R5 ), is shown to indicate color consistency during the growing season. These data are summarized in the following table.

GROWTH STAGE

	R 1	R 5
HSC BALDWIN	127.gy.OL G	127.gy.OL G
CENTIENNIAL	125.m.OL G	125.m.OL G

Foliage colors of the two varieties were clearly different and consistent across the two growth stages studied.

U.S. DEPARTMENT OF AGRICULTURE  
AGRICULTURAL MARKETING SERVICE  
LIVESTOCK, MEAT, GRAIN & SEED DIVISION  
PLANT VARIETY PROTECTION OFFICE  
BELTSVILLE, MARYLAND 20705

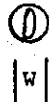
EXHIBIT C  
(Soybean)

OBJECTIVE DESCRIPTION OF VARIETY  
SOYBEAN (*Glycine max* L.)

NAME OF APPLICANT(S) HYPERFORMER SEED COMPANY	TEMPORARY DESIGNATION HB-15578-E4-6	VARIETY NAME HSC Baldwin
ADDRESS (Street and No., or R.F.D. No., City, State, and Zip Code) Suite 3200, Clark Tower 5100 Poplar Avenue Memphis, Tennessee 38137		FOR OFFICIAL USE ONLY PVPO NUMBER 8800146

Choose the appropriate response which characterizes the variety in the features described below. When the number of significant digits in your answer is fewer than the number of boxes provided, place a zero in the first box when number is 9 or less (e.g., ). Starred characters ★ are considered fundamental to an adequate soybean variety description. Other characters should be described when information is available.

1. SEED SHAPE:



1 = Spherical (L/W, L/T, and T/W ratios = < 1.2)

3 = Elongate (L/T ratio > 1.2; T/W = < 1.2)

2 = Spherical Flattened (L/W ratio > 1.2; L/T ratio = < 1.2)

4 = Elongate Flattened (L/T ratio > 1.2; T/W > 1.2)

★ 2. SEED COAT COLOR: (Mature Seed)

1 = Yellow

2 = Green

3 = Brown

4 = Black

5 = Other (Specify) \_\_\_\_\_

3. SEED COAT LUSTER: (Mature Hand Shelled Seed)

1 = Dull ('Corsoy 79'; 'Braxton')

2 = Shiny ('Nebsoy'; 'Gasoy 17')

★ 4. SEED SIZE: (Mature Seed)

Grams per 100 seeds

★ 5. HILUM COLOR: (Mature Seed)

1 = Buff

2 = Yellow

3 = Brown

4 = Gray

5 = Imperfect Black

6 = Black

7 = Other (Specify) \_\_\_\_\_

★ 6. COTYLEDON COLOR: (Mature Seed)

1 = Yellow

2 = Green

★ 7. SEED PROTEIN PEROXIDASE ACTIVITY:

1 = Low

2 = High

★ 8. SEED PROTEIN ELECTROPHORETIC BAND:

1 = Type A (SP1<sup>a</sup>)

2 = Type B (SP1<sup>b</sup>)

★ 9. HYPOCOTYL COLOR:

1 = Green only ('Evans'; 'Davis')

2 = Green with bronze band below cotyledons ('Woodworth'; 'Tracy')

3 = Light Purple below cotyledons ('Beeson'; 'Pickett 71')

4 = Dark Purple extending to unifoliate leaves ('Hodgson'; 'Coker Hampton 266A')

★ 10. LEAFLET SHAPE:

1 = Lanceolate

2 = Oval

3 = Ovate

4 = Other (Specify) \_\_\_\_\_

## 11. LEAFLET SIZE:

☐ 21 = Small ('Amsoy 71'; 'A5312')  
3 = Large ('Crawford'; 'Tracy')

2 = Medium ('Corsoy 79'; 'Gasoy 17')

## 12. LEAF COLOR:

☐ 21 = Light Green ('Weber'; 'York')  
3 = Dark Green ('Gnome'; 'Tracy')

2 = Medium Green ('Corsoy 79'; 'Braxton')

## ★ 13. FLOWER COLOR:

☐ 2

1 = White

2 = Purple

3 = White with purple throat

## ★ 14. POD COLOR:

☐ 1

1 = Tan

2 = Brown

3 = Black

## ★ 15. PLANT PUBESCENCE COLOR:

☐ 2

1 = Gray

2 = Brown (Tawny)

## 16. PLANT TYPES:

☐ 31 = Slender ('Essex'; 'Amsoy 71')  
3 = Bushy ('Gnome'; 'Govan')

2 = Intermediate ('Amcor'; 'Braxton')

## ★ 17. PLANT HABIT:

☐ 1

1 = Determinate ('Gnome'; 'Braxton')

2 = Semi-Determinate ('Will')

3 = Indeterminate ('Nebsoy'; 'Improved Pelican')

## ★ 18. MATURITY GROUP:

☐ 0 ☐ 9

1 = 000

2 = 00

3 = 0

4 = I

5 = II

6 = III

7 = IV

8 = V

9 = VI

10 = VII

11 = VIII

12 = IX

13 = X

## ★ 19. DISEASE REACTION: (Enter 0 = Not Tested; 1 = Susceptible; 2 = Resistant)

## BACTERIAL DISEASES:

★

☐ RBacterial Pustule (*Xanthomonas phaseoli* var. *sojensis*)

★

☐ RBacterial Blight (*Pseudomonas glycinea*)

★

☐ RWildfire (*Pseudomonas tabaci*)

## FUNGAL DISEASES:

★

☐ 0Brown Spot (*Septoria glycines*)Frogeye Leaf Spot (*Cercospora sojae*)

★

☐ R

Race 1

☐ 0

Race 2

☐ R

Race 3

☐ 0

Race 4

☐ 0

Race 5

☐

Other (Specify)

☐ RTarget Spot (*Corynespora cassiicola*)☐ RDowny Mildew (*Peronospora trifoliorum* var. *manshurica*)☐ RPowdery Mildew (*Microsphaera diffusa*)

★

☐ QBrown Stem Rot (*Cephalosporium gregatum*)☐ SStem Canker (*Diaporthe phaseolorum* var. *caulivora*)



## 19. DISEASE REACTION: (Enter 0 = Not Tested; 1 = Susceptible; 2 = Resistant) (Continued)

## FUNGAL DISEASES: (Continued)

- ★ ☐ R Pod and Stem Blight (*Diaporthe phaseolorum* var. *sojae*)
- ☐ R Purple Seed Stain (*Cercospora kikuchii*)
- ☐ R Rhizoctonia Root Rot (*Rhizoctonia solani*)
- Phytophthora Rot (*Phytophthora megasperma* var. *sojae*)
- ★ ☐ 0 Race 1 ☐ 0 Race 2 ☐ R Race 3 ☐ 0 Race 4 ☐ 0 Race 5 ☐ 0 Race 6 ☐ 0 Race 7
- ☐ 0 Race 8 ☐ 0 Race 9 ☐ Other (Specify) \_\_\_\_\_

## VIRAL DISEASES:

- ☐ 0 Bud Blight (Tobacco Ringspot Virus)
- ☐ 0 Yellow Mosaic (Bean Yellow Mosaic Virus)
- ★ ☐ 0 Cowpea Mosaic (Cowpea Chlorotic Virus)
- ☐ 0 Pod Mottle (Bean Pod Mottle Virus)
- ★ ☐ 0 Seed Mottle (Soybean Mosaic Virus)

## NEMATODE DISEASES:

- Soybean Cyst Nematode (*Heterodera glycines*)
- ★ ☐ R Race 1 ☐ S Race 2 ☐ R Race 3 ☐ S Race 4 ☐ Other (Specify) \_\_\_\_\_
- ☐ 0 Lance Nematode (*Hoplolaimus Colombus*)
- ★ ☐ R Southern Root Knot Nematode (*Meloidogyne incognita*)
- ★ ☐ 0 Northern Root Knot Nematode (*Meloidogyne Hapla*)
- ☐ R Peanut Root Knot Nematode (*Meloidogyne arenaria*)
- ☐ 0 Reniform Nematode (*Rotylenchulus reniformis*)
- ☐ OTHER DISEASE NOT ON FORM (Specify): \_\_\_\_\_

## 20. PHYSIOLOGICAL RESPONSES: (Enter 0 = Not Tested; 1 = Susceptible; 2 = Resistant)

- ★ ☐ 0 Iron Chlorosis on Calcareous Soil
- ☐ Other (Specify) \_\_\_\_\_

## 21. INSECT REACTION: (Enter 0 = Not Tested; 1 = Susceptible; 2 = Resistant)

- ☐ 0 Mexican Bean Beetle (*Epilachna varivestis*)
- ☐ 0 Potato Leaf Hopper (*Empoasca fabae*)
- ☐ Other (Specify) \_\_\_\_\_

## 22. INDICATE WHICH VARIETY MOST CLOSELY RESEMBLES THAT SUBMITTED.

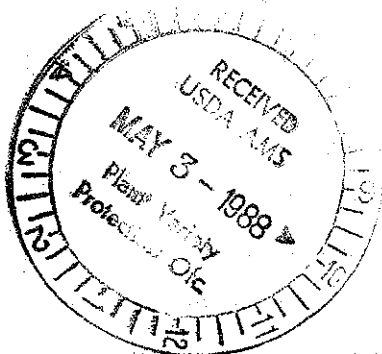
CHARACTER	NAME OF VARIETY	CHARACTER	NAME OF VARIETY
Plant Shape	Centennial	Seed Coat Luster	Bedford
Leaf Shape	Jeff	Seed Size	Gordon
Leaf Color	Jeff	Seed Shape	Bedford
Leaf Size	Jeff	Seedling Pigmentation	Jeff

## 23. GIVE DATA FOR SUBMITTED AND SIMILAR STANDARD VARIETY: Paired Comparison Data

VARIETY	NO. OF DAYS MATURITY	PLANT LODGING SCORE	CM PLANT HEIGHT	LEAFLET SIZE		SEED CONTENT		SEED SIZE G/100 SEEDS	NO. SEEDS/POD
				CM Width	CM Length	% Protein	% Oil		
HSC Baldwin Submitted	134	1.8	119	0	0	0	0	13.0	0
Centennial Similar Variety	138	1.8	107	0	0	0	0	15.2	0

## PUBLICATIONS USEFUL AS REFERENCE AIDS FOR COMPLETING THIS FORM:

1. Caldwell, B.E., ed. 1973. Soybeans: Improvement, Production, and Uses. Amer. Soc. Agron. Monograph No. 16.
2. Buttery, B.R. and R.I. Buzzell. 1968. Peroxidase activity in seeds of soybean varieties. Crop Sci., 8: 722-725.
3. Hymowitz, T. 1973. Electrophoretic analysis of SBTI-A<sub>2</sub> in the USDA soybean germplasm collection. Crop Sci., 13: 420-421.
4. Payne, R.C. and L.F. Morris. 1976. Differentiation of soybean cultivars by seedling pigmentation patterns. J. Seed Technol. 1: 1-19.



## EXHIBIT D

## ADDITIONAL DESCRIPTION OF THE VARIETY

NAME OF VARIETY	POD FLOWER PUB. HILA .....COLOR.....	MAT. GROUP	Ht.	Lod.	Type Shape	Type Plant Habit
HSC Baldwin	Tan Purple TN	Black VI	47"	2	1	Determinate
Centennial	Tan Purple TN	Black VI	42"	2	1	Determinate

HSC Baldwin is a medium tall, bushy variety in the mid to late group VI maturity. It features good standability, purple flowers, tan pods, and tawny pubescence. The foliage is dense with medium-sized leaves, medium green in appearance. Seed is yellow with black hila and shiny seed coat luster. However, variation is noticeable due to varied environmental effects.

## EXHIBIT E

## STATEMENT OF THE BASIS OF APPLICANTS OWNERSHIP

HSC Baldwin was bred and developed by Dr. George A. Berger, who will serve as the applicant representative for Hyperformer Seed Company. Exclusive marketing rights are assigned to Hyperformer Seed Company by Dr. George Berger.